भारतीय मानक
Indian Standard

IS 550 (Part 1) : 2022

तिजोरियाँ
भाग 1 विशिष्टि
(छठा पुनरीक्षण)

Safes
Part 1 Specification
(Sixth Revision)

ICS 13.310

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Security Equipment Sectional Committee, MED 24

FOREWORD

This Indian Standard (Part 1) (Sixth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Security Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

Security equipment plays a vital role in secured storage of valuables and important documents. These are used in a wide variety of establishments like banks, commercial organizations, hotels, shops, etc. One of the most common and important security equipment is safe, popularly used to store cash, valuables and important documents.

This standard was first published in 1954 and was revised in 1967, 1975, 1991, 2003 and 2014.

The important changes in this revision are:

a) Definitions for "barrier" and "automatic relocking device" are added.
b) Gap between door and frame is restricted to the minimum gap observed in tested and approved sample with an upper limit of 3 mm.
c) Remarks for elaboration of performance for class-X safe are corrected.
d) Total added thickness of steel plates across walls of the safe, is modified to 5 mm (min).
e) Flexibility provided to fix mechanical combination lock or electronic lock in place of second key lock.
f) Flexibility added in terms of volume (in addition to size).
g) Cable hole with restricted size is permitted for incorporating electronic features in the safe.
h) Requirements for IS 17566 'Key locks for security equipment — Specification' and IS 16723 'Combination lock — Specification', have been added.

This Indian Standard is published in 3 parts. The other parts in this series are:

Part 2 Tests for burglary resistance
Part 3 Tests for fire resistance

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SAFES

PART 1 SPECIFICATION

(Sixth Revision)

1 SCOPE

This standard (Part 1) specifies the dimensions, general requirements and performance criteria for safes.

2 REFERENCES

The standards listed in Annex A contain provisions, which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard following definitions shall apply.

3.1 Type Approval — It is the acceptance of a particular class/designation for certification by the certifying authority.

3.2 Revalidation — A testing and acceptance of an already approved class/designation when tested at specified periodic intervals and/or consequent to some change in design parameters.

3.3 Rebate — The part of the body of the safe which comes between the resting surface of door and the shooting bolts.

3.4 Barrier — Material/combination of materials that offers resistance to penetration with burglarious intention and/or ingress of heat.

3.5 Automatic Relocking Device — It is an auxiliary locking device intended to be activated during burglary attempt on the lock. Such a device will keep a safe locked even if the lock is dislodged.

4 CLASSIFICATIONS

Safes shall be classified as given in Table 1.

5 DIMENSIONS AND SIZES

5.1 Dimensions of safes shall be as specified in Table 2.

5.2 Sizes

Sizes of the safe shall be denoted by its internal height and volume as specified in Table 2.

6 MATERIALS

Materials specified in Table 3 are for general guidance only. The critical quality parameters of the materials used for the components shall be declared by the manufacturer at the time of type approval and records of details of material shall be maintained for conformity during routine production.

7 DESIGNATIONS

Safe shall generally be designated by its classification code and size/actual size.

> *Example:*
>
> A safe of class CC (classification code TL 15 × 6 – FR 30) and actual size 900 mm shall be designated as:
>
> TL 15 × 6 – FR 30 – 900

8 CONSTRUCTIONS AND WORKMANSHIP

8.1 Body

The body shall be manufactured in multi-bend construction. The body shall be made so as to provide rebate on all four sides. The construction of body shall be such that the resultant force of pull on the door is resisted by a member that is either an integral part of the body or is welded to the inner part of the body and not by any component part that is screwed or riveted. The recesses for the sliding bolts may be individual or continuous slot.

8.2 Anchoring Arrangement

Anchoring arrangement, if required by the purchaser, shall be suitably provided.

8.3 Door

Door shall be made of mild steel plates, backed with suitable barrier(s) to meet the performance requirements as per the class (*see* Table 1 for the classification). Door shall fit snugly. In the closed position, the gap at any place between the door edge and the body shall not be more than 3 mm. However, this gap in the supplied product shall not be more than the minimum measured gap across samples submitted for type approval. In the secured position, the door shall not have a play of more than 1 mm in the direction in which it opens.

8.4 Door Fittings

8.4.1 *Hinges*

Hinges shall be of pivot type. They shall be so designed as to allow free movement of the door without friction or play. An arrangement to facilitate oiling of hinges shall be provided.

8.4.2 *Bolts*

The bolt work shall be mounted on a secure base, such as door slab. The door sides through which the bolts slide shall be minimum 5 mm thick and solidly welded to the doorplate. The bolts shall slide smoothly when the handle is turned. Single piece bolt of equivalent shear area of sliding/fixed nature is also permissible subject to a minimum two-thirds height of engagement in the body. The connection between the lock or locks and the bolt work shall be such that the pressure applied on the bolts, either directly or through the handle of the safe, shall not be transmitted to the fixing screw of the lock or locks.

8.5 Handles

Handle shall be made out of materials as specified in Sl No. (iii) of Table 3.

8.6 Locks

8.6.1 *Key Locks*

Key locks when used in accordance with Sl. No. (x) of Table 2, shall be in compliance with type A of IS 17566. Grade of the locks shall be A4 or A6 or A8 or A12 or A13 or A14.

8.6.2 *Mechanical Combination Locks*

Mechanical combination locks when used in accordance with Sl No. (x) of Table 2, shall be in compliance with class I (or class II or class III) of IS 16723.

8.6.3 *Any Other Lock*

Electronic combination lock or any other type of lock may be provided in addition to the number of key locks given in Sl No. (x) of Table 2.

8.6.4 *Lock Bolt Engagement*

The main bolt of the locks used in accordance with clause **8.6.1**, **8.6.2** or **8.6.3** shall have minimum 5 mm engagement with the locking bars of the bolt work.

8.6.5 In addition, for safes of class A and above, provision shall be made for retrofitting time lock.

Table 1 Classification of Safes

(*Clauses* 4, 8.3, 12.2 *and* 12.4)

Sl No.	Class	Classification Code	Remarks
(1)	(2)	(3)	(4)
i)	D	Deposit safe (DEP 15 – D)	Safe with door having tool resisting capacity of 15 min and resistance to trapping/fishing deposited envelops or bags for 15 min
ii)	C	TL 30 D × TL 10 × 5 – FR 30	Safe with door having tool resisting capacity of 30 min and other five sides having tool resisting capacity of 10 min each and with fire resisting capacity of 30 min
iii)	CC	TL 15 × 6 – FR 30	Safe having tool resisting capacity on all six sides for 15 min each and with fire resisting capacity of 30 min
iv)	CCC	TL 30 × 6 – FR 30	Safe having tool resisting capacity on all six sides for 30 min each and with fire resisting capacity of 30 min
v)	BB	TRTL – 15 × 6	Safe having torch and tool resisting capacity on all six sides for 15 min each
vi)	A	TRTL – 30 × 6	Safe having torch and tool resisting capacity on all six sides for 30 min each
vii)	A+	TRTL – 45 × 6	Safe having torch and tool resisting capacity on all six sides for 45 min each
viii)	AA	TRTL – 60 × 6	Safe having torch and tool resisting capacity on all six sides for 60 min each
ix)	AAA	TRTL – 90 × 6	Safe having torch and tool resisting capacity on all six sides for 90 min each
x)	X	TXTL – 60 × 6	Safe having torch and tool resisting capacity on all six sides for 60 min each and explosive resistance when tested in line with IS 550 (Part 2)

NOTE — Time specified is minimum.

Table 2 Dimensions, Sizes and General Requirements

(*Clauses* 5.1,5.2, 8.6.2, 8.6.3 *and* 13.3)

Sl No.	**Parameter**	**Recommended Standard Size**									
		Single Door								Double Door	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	Size[1]	470	580	850-S[2]	850-L [2]	1 030	1 340	1640	1 860	1 340	1 600
ii)	Inside dimension of safe[1] :										
	a) Height	470	580	850	850	1 030	1 340	1 640	1 860	1 340	1 600
	b) Width	340	415	415	570	570	570	750	750	870	960
	c) Depth	290	365	365	440	440	440	585	585	440	510
iii)	Tolerance. on inside dimensions, mm	± 25			± 30			± 40		± 40	
iv)	Internal volume, in liters (Gross)[1]	46	88	129	213	258	336	720	816	513	783
v)	Tolerance on internal volume	– 7.5 percent (no upper limit)									
vi)	Minimum weight, kg	a) Minimum weight of the safe shall be 300 kg b) At the time of type approval or revalidation, the manufacturer shall declare the nominal weight of the safe c) The observed value shall invariably be within +10/– 5 percent of the declared nominal value									
vii)	Thickness of outer body plate and inner body plates, as well as door outer plate and door Inner plate:	Nominal thicknesses of all plates used across wall thickness which resist making a through opening, shall add up to 5 mm (minimum), subject to a minimum nominal thickness of 2 mm for each plate									
viii)	Thickness of door slab (thickness over rebate), *Min*	14	14	14	14	18	18	18	18	18	18
ix)	Thickness of door over bolt work, *Min*	◄──── Not less than 25 mm ────►									
x)	Number of locks:										
	a) Number of key locks on the door, *Min*	1	1	1	1	1	1	1	1	1	1
	b) Any other type of lock (key lock/mechanical combination lock/electronic lock) on door, *Min*						1	1	1	1	1
xi)	Number of bolts on hinge side[3], *Min*	3	3	4	4	4	4	4	4	4	5
xii)	No. of bolts on side opposite of hinge side[3], *Min*	3	3	4	4	4	4	4	4	4[4]	5[4]
xiii)	No. of bolts at the top[3], *Min*	0	0	0	0	0	0	0	0	4	4
xiv)	No. of bolts at the bottom [3], *Min*	0	0	0	0	0	0	0	0	4	4
xv)	Size of each bolts (area of bolt section [3]), in mm^2, *Min*	800	800	800	800	800	800	800	800	800	800
xvi)	Depth of engagements of the bolts[3], *Min*	15	15	15	15	15	15	15	15	15	15

NOTES

1 For any class of safe, any size other than recommended standard sizes, meeting following requirements may also be covered under the scope of this Standard:

a) having dimensions (height, width, depth) less than that of type tested safe which had passed the tests for the relevant class of safe as outlined in IS 550 (Part 2) and IS 550 (Part 3); and

b) complying with all other design parameters (Sl No. vii to xvi of Table 2) of nearest recommended standard size of safe.

2 850 - S stands for small safe of internal height 850 mm, and 850 - L stands for larger safes of internal height 850 mm.

3 Sl No. xi) to xv) is applicable for multi bolt design only. For alternative design **8.1** and **8.4.2** may be referred.

4 Number of shooting bolts on side opposite to hinge for left hand door of double door safe shall be nil.

Table 3 Materials for Safes

(*Clauses* 6 *and* 8.5)

Sl No. (1)	Part (2)	Material (3)
i)	Outer body, inner body, back, door, hinge, bolt work, internal fixtures, etc.	Any grade of steel having minimum tensile strength of 270 MPa [*see* IS 1079, IS 2062, IS 1875, IS 513 (Part 1), IS 513 (Part 2) and IS 5986]
ii)	Drill resistant armour plate	Any grade of steel having minimum tensile strength of 270 MPa [*see* IS 1079, IS 2062, IS 513 (Part 1) and IS 513 (Part 2)]
iii)	Handles and other fittings	Cast brass or tin bronze or mild steel powder coated or stainless steel or ABS or any other material suitable for the purpose

8.7 Automatic Relocking Device

An automatic relocking device one for each key lock shall be fitted in the door which being always on guard, shall come into operation if a lock is dislodged by explosives or other means.

8.8 The cable hole size, if provided shall not exceed 16 mm in diameter.

9 INTERNAL FIXTURES

The number of adjustable or removable shelves in the safes may be given as specified by the purchaser. The drawers may be secured with good quality lock.

10 PAINTING

The inside and outside surfaces of the safe shall be painted or powder coated. In case of paint, an appropriate primer and undercoating shall be used in accordance to industry practices.

The minimum overall thickness of the coatings shall be 50 µ for powder coating and 70 µ for liquid paints. Cross hatch test shall be conducted to conform the adhesion of coating in accordance with **10.1**.

10.1 Cross Hatch Test

a) Make 6 parallel cut marks using sharp metal pointer and straight edge, through the painted/coated surface, so as to make the base surface visible through cut marks.

b) Cut marks shall be minimum 20 mm long and at 2 mm distance from each other.

c) Make 6 similar cut marks in the direction perpendicular to first set of cut marks, with same length and spacing.

d) These 12 cut marks together shall make a pattern of 25 squares of 2 mm × 2 mm size, totally separated from each other.

e) A good quality transparent adhesive tape not less than 20 mm width shall be stuck on the pattern, parallel to any one set of cut marks.

f) To ensure continuous contact with paint/coat film, rub the tape firmly and remove air bubbles under the tape, if any.

g) Within 60 to 120 s after sticking the tape, remove it by seizing free end of the tape and rapidly pulling it off at an angle close to 180º.

h) Painting/coating quality is considered as acceptable, if no part of any 2 mm × 2 mm square of paint/coat comes off the surface due to pulling the tape.

11 MARKING

11.1 Marking of Safes

A metal plate showing classification of safe together with manufacturer's name and the year of manufacture shall be fixed on the inner face of the door shutter of safes.

11.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

12 TESTS AND CRITERIA FOR CONFORMITY

12.1 Separate samples, selected randomly shall be tested as follows:

Sample	*Nature of Test*	*Relevant IS No.*
1 No. safe	Burglary resistance	IS 550 (Part 2)
1 No. safe[1]	Fire endurance	IS 550 (Part 3)
1 No. safe[1]	Fire and impact	IS 550 (Part 3)

[1] As applicable.

12.2 The safes shall be considered to be conforming to the requirements of this standard, if they successfully pass the tests for the minimum period as specified in Table 1.

12.3 The tests specified in **12.1** shall be considered as type tests and shall be carried out for initial approval of design or when any subsequent change in the design of the safe is made. Subsequent to the type approval, these tests shall be carried out once in 4 years in such a manner that each class of safe, for which the manufacturer has obtained approval, is tested at least once in 4 years.

12.4 For the purpose of evaluation of burglary resistance (type approval and revalidation), the door and five sides of the safe shall be tested in accordance to the relevant provisions of IS 550 (Part 2). The sample shall be considered to have passed, if the door and five sides tested meet the requirements prescribed in Table 1.

12.5 The tests for evaluation of burglary resistance as well as for fire endurance and fire and impact shall be carried out at the frequency specified in **12.3**.

13 TECHNICAL DOCUMENTATION AND DESIGN DEFINITION

13.1 The manufacturer shall provide an engineering drawing (a typical drawing is given in Fig. 1) of the test specimen, along with samples offered for testing, indicating the following:

a) A statement of the product designation as per IS 550 (Part 1);

b) Declared nominal weight of the sample for testing;

c) Inside dimensions and wall thickness with manufacturing tolerances;

d) Horizontal and vertical cross-sections, thickness and relevant mechanical properties of individual layers of barrier shall be indicated;

e) A statement of design parameters in line with Table 2;

f) Information about any materials or devices intended to generate gas, smoke or any other substance which may cause harm or injury to the test team members during testing;

g) A list of the sizes covered by the same design shall also be indicated by their designations, in the event of samples being submitted for type approval or revalidation; and

h) Declaration for **8.6.1** and **8.6.2** to be provided by the manufacturers.

13.2 The documentation on basis of which type approval or revalidation is obtained, shall be authenticated by the certifying authority and the testing agency. Copies of the authenticated document shall be retained by the certifying organization and the manufacturer and shall be the reference point for future validations or disputes.

13.3 Any deviation from the approved technical documentation, beyond the tolerances permitted in Table 2, shall constitute a design change and shall necessitate a revalidation of the design as indicated in **12**.

14 PACKING

Each safe will be packed in accordance with the best trade practice, with its door bolted, but not locked. The keys shall be separately sealed in a box/pouch and placed inside the safe. The keys may also be packed and dispatched separately or delivered in some other manner, if the purchaser so requires.

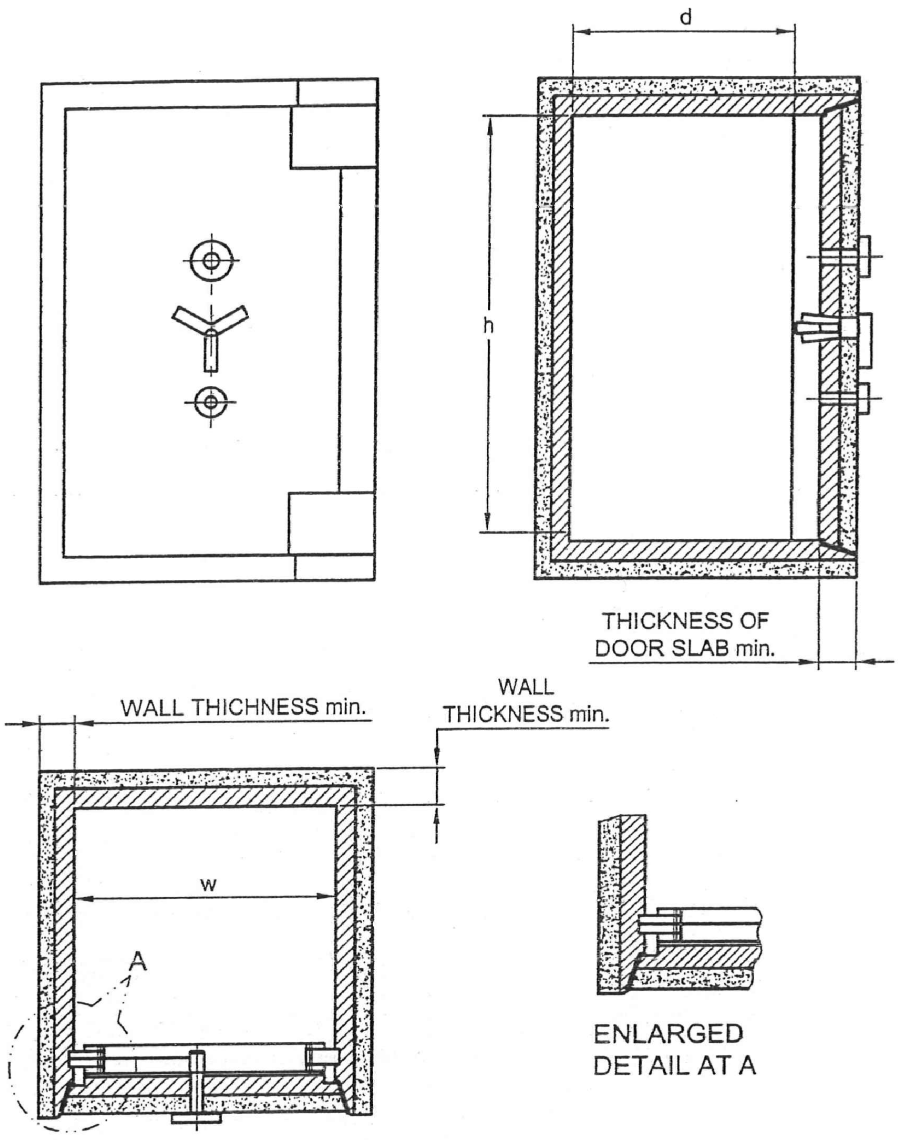

Fig. 1 General Arrangement of Safes

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
513 (Part 1) : 2016	Cold rolled low carbon steel sheets and strips: Part 1 Cold forming and drawing purpose (*sixth revision*)
513 (Part 2) : 2016	Cold rolled low carbon steel sheets and strips: Part 2 High tensile and multi-phase steel (*sixth revision*)
550 (Part 2) : 2016	Safes: Part 2 Test for burglary resistance (*fifth revision*)
550 (Part 3) : 2005	Safes: Part 3 Test for fire resistance (*third revision*)
1079 : 2017	Hot rolled carbon steel sheets, plates and strips — Specification (*seventh revision*)
1875 : 1992	Carbon steel billets, blooms, slabs and bars for forging (*fifth revision*)
2062 : 2011	Steel for general structural purposes — Specification (*seventh revision*)
5986 : 2017	Hot rolled steel sheets, plates and strips for forming and flanging purpose — Specification (*fourth revision*)
16723 : 2020	Combination lock — Specification (*first revision*)
17566 : 2021	Key locks for security equipment — Specification

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Security Equipment Sectional Committee, MED 24

Organization	*Rpresentative(s)*
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Bank of India, Mumbai	Capt Akhilesh Kumar
CSIR-Central Building Research Institute, Roorkee	Dr Suvir Singh Shei Rajiv Goel (*Alternate*)
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Organization	*Rpresentative(s)*
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In Personal Capacity	Shri Ajit G. Naravane
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Member Secretary

Ms. Khashboo Kumari
Scientist 'C' (MED), BIS

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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Amendments Issued Since Publication

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